Biochemistry Project (Life Sciences 11)

Photosynthesis, Cellular Respiration, Fermentation

"If you can't explain it to a six year old, you don't understand it yourself." – Albert Einstein (source debated)

Premise: In groups of 3-4, your task is to create a video ***showing*** and ***explaining*** the biochemical processes and stages involved in either: A) photosynthesis; or B) cellular respiration and fermentation. Your video can be any format you choose (stop-motion, animation, movie, animated powerpoint) but must incorporate props that represent each of the key players in the process. Since the intent of this video is to be ***as simple as possible***, if there are aspects of your video that you would like to explain separately and in more detail, please include a supplemental explanation with your project.

The focus of this project is on movement. ***Do not*** simply show images taken from google and then explain them. You must physically show the movement of ions and other molecules across a membrane.

Concepts to Include:

- Structure of chloroplast or mitochondrion
- Energy carriers and electron transport chains
- Active transport, passive transport, concentration gradients

Key Vocabulary:

(Note: Your video should probably include the following concepts. It is up to you which ones are most important.)

Photosynthesis:		**Cellular Respiration and Fermentation**	
- H^+ ions (protons) - Electrons - Sugar - Energy - ADP, ATP - NADP+, NADPH - Electron carriers - H_2O	- O_2 - CO_2 - ATP synthase - Chloroplast - Stroma - Thylakoid space	- Glucose - NAD+, NADH - FAD, $FADH_2$ - ADP, ATP - Pyruvate - Energy - CO_2 - O_2 - H^+ ions (protons)	- H_2O - Alcohol - Lactic acid - ATP synthase - Mitochondria - Matrix - Intermembrane space

Marking Scheme

	4	**3**	**2**	**1**
Accurate, Sophisticated Understanding of Concepts **Weighting: 6 (/28)**	Video is detailed and accurate. It is evident that the producers understand the concepts and have made efforts to make it their own. Effort has been put towards simplifying complicated concepts and explaining them in an accessible manner. (E.g. use analogies, use comparisons to everyday objects.)			Video does not demonstrate much understanding of the biochemical processes. Explanations draw heavily upon the powerpoint and other available sources (e.g. published videos) and are not in producers' own words. Key concepts have been misrepresented. Little to no effort has been made to simplify the concepts.
Entertainment and Creativity **Weighting: 2 (/8)**	Video is entertaining, informative, and easy to understand. Concepts are shown in a creative and/or 'different' way.			Video does not hold attention, either because it is uninteresting or difficult to understand.
Presentation and Organization **Weighting: 2 (/8)**	Video is well edited. Audio is clear [and subtitles have been added if it is not.] Video flows smoothly and transitions well.			Video is poorly edited; information is presented poorly.
Credits and/or Bibliography **Weighting: 1 (/4)**	All sources (of images, information) are correctly cited in MLA format.			Sources have not been cited.
Bonus Marks	A small number of bonus points may be awarded (at the discretion of the teacher) to groups that go above and beyond requirements in some way.			
Total (/48)				